

Leaf Chromatography

Objective: Use background information about mixtures and solutions to chemically determine the colors within a leaf that are used in the process of photosynthesis.

Standards: 5.1L.1 Explain that organisms are composed of parts that function together to form a living system. 5.2L.1 Explain the interdependence of plants, animals, and environment, and how adaptation influences survival.

Materials:

Isopropyl alcohol
Green leaf
Coffee filter or chromatography paper
Coin
Beaker
Ruler
Scissors
Pencil
Tape
Colored pencils or crayons

Procedure:

- 1 Obtain a strip of chromatography paper or cut a 2 ½ cm strip from a coffee filter.
- 2 Use a ruler to measure and draw a light pencil line 2 cm above the bottom of the paper strip.
- 3 Wrap a leaf around a coin with the waxy side of the leaf facing outward. Now rub the leaf along the pencil line on the paper strip until you make a dark green line. DO NOT RUB THE LEAF ABOVE OR BELOW THE LINE. RUB THE LEAF ON THE LINE ONLY.
- 4 Tape the top of the paper strip to a pencil so that the end of the strip with the green line hangs down. The pencil should be able to sit across the top of the beaker with the bottom of the paper strip just touching the bottom of the beaker. Cut off any excess paper from the top of the strip if it is too long. DO NOT CUT THE BOTTOM OF THE STRIP WITH THE GREEN LINE.
- 5 Remove the pencil/paper strip from the beaker for now.
- 6 Carefully add isopropyl alcohol to the beaker until it reaches a depth of 1 cm in the beaker.
- 7 Lay the pencil across the top of the beaker with the paper strip extending into the alcohol. MAKE SURE THAT THE LEVEL OF THE ALCOHOL IS BELOW THE GREEN LINE ON YOUR PAPER STRIP. IF THE ALCOHOL IS GOING TO COVER THE GREEN LINE, POUR OUT SOME ALCOHOL BEFORE YOU GET THE GREEN LINE WET.
- 8 Observe as the alcohol gets absorbed and travels up the paper. This may take up to 20 minutes. Do not touch your experiment during this time.
- 9 Using colored pencils or crayons, draw your results.

Questions:

1. What was the solvent in this investigation?
2. What was the solute in this investigation?
3. What was the mixture in this investigation?
4. Describe each of the following (use your textbook or a dictionary if necessary):

- a. Substance**
- b. Mixture**
- c. Physical property**
- d. Chemical property**
- e. Chromatography**
- f. Chromatogram**
- g. Solvent**
- h. Solute**
- i. Capillary action**
- j. Pigments**
- k. Photosynthesis**

Scientific Inquiry Work Sample

F	D	C&P	A&I

Physical	Life	Earth

Name _____

Experiment Name _____

Forming a Hypothesis:

*What are you trying to find out?

*What do you think will happen?

Designing an Investigation:

- Materials: _____

- Variables: (Would the _____ make a difference?)

- Picture of purposed experiment:

Collecting and Presenting Data:

- How will you collect data?
- How will you present it? (drawing, graph, demonstration)

Analyzing and Interpreting Results:

- Conclusions:

Forming a Hypothesis:

*What are you trying to find out?

*What do you think will happen?

My Hypothesis is:

Designing an Investigation:

*Materials I need:

- | | |
|----------|-----------|
| 1. _____ | 7. _____ |
| 2. _____ | 8. _____ |
| 3. _____ | 9. _____ |
| 4. _____ | 10. _____ |
| 5. _____ | 11. _____ |
| 6. _____ | 12. _____ |

Variables: (Would the _____ make a difference?)

- | |
|----------|
| 1. _____ |
| 2. _____ |
| 3. _____ |
| 4. _____ |

Picture of purposed experiment:



Collecting and Presenting Data:

How will you collect data? (Observations, video, pictures, recordings)

How will you present it? (Drawing, line-bar-plot, graph, T-chart, list, demonstration)

Analyzing and Interpreting Results

Restate your hypothesis:

State whether your hypothesis was correct or incorrect and explain why:

Explain any variables that did or may have effected your outcome:

Conclusions/ what the results were are what might you change next time?

